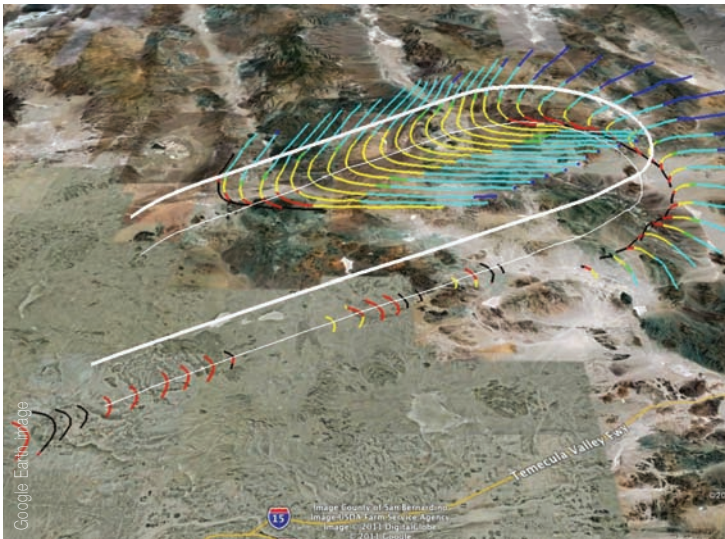




technology opportunity

Display Provides Pilots with Real-Time Sonic Boom Information



Enabling supersonic air travel over land while reducing noise pollution



Engineers at NASA's Dryden Flight Research Center have developed a software system capable of displaying the location and intensity of shock waves caused by supersonic aircraft. This technology can be integrated into cockpits or flight control rooms to help pilots place any loud booms in a specific location, minimizing their impact in populated areas. The system processes vehicle and flight parameters as well as data regarding current atmospheric conditions. The display provides real-time information regarding sonic boom location and intensity, enabling pilots to make the necessary flight adjustments to control the timing and location of sonic booms. This technology can be used on current-generation supersonic aircraft, which generate loud sonic booms, as well as future-generation low-boom aircraft, anticipated to be quiet enough to allow use over populated areas.

Benefits

- **Enables overland travel:** Because pilots can control the location and intensity of sonic booms, this technology will allow future-generation supersonic aircraft to fly over land.
- **Reduces noise pollution:** This technology allows for appropriate placement of the boom to minimize its impact on the ground.
- **Provides information in real time:** The system uses real-time data to generate its information, allowing pilots to respond to changes in flight parameters or atmospheric conditions, making the appropriate adjustments to minimize sonic boom exposure.

Applications

- **Commercial supersonic vehicles:** Several companies are developing commercial aircraft and will require a system of this kind so they can ensure that sonic booms do not adversely impact populated areas.
- **Federal Aviation Administration (FAA):** The FAA will require a system of this type to approve flight plans, monitor aircraft in flight, and review flight data to enforce regulations.
- **Military aircraft:** This technology can be used to minimize impact of military flights and enhance the safety of flight missions.

Technology Details

Supersonic aircraft generate shock waves that move outward in all directions and extend to the ground. As a cone of pressurized air spreads across the landscape along the flight path, it creates a continuous sonic boom. Several factors can influence sonic booms: weight, size, and shape of the aircraft; its altitude and flight path; and weather and atmospheric conditions. This technology allows pilots to control the impact of sonic booms.

How It Works

Dryden's interactive sonic boom display leverages existing tools developed and enhanced by the U.S. Air Force and NASA to predict sonic boom parameters. The prediction data is integrated with a real-time, local-area moving-map display that is capable of displaying the aircraft's current sonic boom footprint at all times. The pilot can choose from a menu of pre-programmed maneuvers—such as accelerations, turns, or pushovers—and the predicted sonic boom footprint for that maneuver appears on the map. This allows the pilot to select or modify parameters to either avoid generating a sonic boom or to place the sonic boom in a specific location. The system also provides pilots with guidance on how to execute the chosen maneuver.

Why It Is Better

Aerospace companies have the technology capability to build faster aircraft for overland travel. However, the industry has not yet developed a system to support flight planning and management of sonic booms. Dryden's interactive display provides real-time information regarding sonic boom location and intensity, allowing pilots to mitigate and strategically direct shock waves. This cutting-edge technology enables faster commercial flight, including supersonic flight, without disturbing population centers on the ground. The sonic boom display can also improve safety by providing military pilots with real-time data to ensure that sonic booms remain controlled and undetected on sensitive missions.

Patents

Dryden is seeking patent protection for this technology.

Licensing and Partnering Opportunities

This technology is part of NASA's Innovative Partnerships Program, which seeks to transfer technology into and out of NASA to benefit the space program and U.S. industry. NASA invites companies to consider licensing this Real-Time Interactive Sonic Boom Display (DRC-008-001) for further development and commercial applications.

For more information about this technology, please contact:

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